UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte FUSASUKE GOTOH,
HIROSHI ISHIGURO,
NAOKI FUKUDA,
and
TOSHIHISA OHATA

Appeal No. 2006-2829
Application No. 09/925,020
Technology Center 3600

Decided: November 9, 2007

Before WILLIAM F. PATE, III, TERRY J. OWENS, and JENNIFER D. BAHR, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

The Appellants appeal from a rejection of claims 1-18, which are all of the pending claims.

THE INVENTION

The Appellants claim a roller bearing. Claim 1 is illustrative:

> 1. A rolling bearing apparatus comprising:
> a roller bearing including
> a plurality of rolling elements held between an inner ring and an outer ring by a retainer, and
> grease sealed in said rolling bearing by a seal;
> a rotary body provided with said outer ring; and
> a shaft provided with said inner ring, wherein said rolling bearing apparatus is configured such that said rotary body and said shaft are connected together by a clutch mechanism,
> when said rotary body and said shaft are connected, said rolling bearing can be used on receiving a rotation load, while the reactive rotation between said inner and outer rings is zero, and
> wherein an initial radial clearance between said inner and outer rings is set such that a bearing effective clearance when said rolling bearing is incorporated between said rotary body and said shaft can provide a positive value.

THE REFERENCES

Brucher	US 4,371,220	Feb. 1, 1983
Teramachi	US 4,629,337	Dec. 16, 1986
Dreschmann	US 4,650,195	Mar. 17, 1987
Takano	US 5,655,844	Aug. 12, 1997
Tanaka[1]	US 6,170,625 B1	Jan. 9, 2001
Iso	US 6,329,326 B1	Dec. 11, 2001
		(filed Sep. 28, 1999)

THE REJECTIONS

[1] The Examiner relies upon Tanaka as an English equivalent of JP 11-22753, and Iso as an English equivalent of JP 2000-119673 (final rejection mailed June 10, 2005, p. 2). Because the Examiner cites to Tanaka and Iso and the Appellants do not object to those substitutions, we consider Tanaka and Iso to be the references relied upon by the Examiner in the rejections.

The claims stand rejected under 35 U.S.C. § 103 as follows: claims 1, 9, 17 and 18 over Tanaka in view of Iso and Takano; claims 2 and 10 over Tanaka in view of Iso, Takano and Brucher; claims 3 and 11 over Tanaka in view of Iso, Takano and Teramachi; claims 4 and 12 over Tanaka in view of Iso, Takano, Brucher and Teramachi; claims 5 and 13 over Tanaka in view of Iso, Takano and Dreschmann; claims 6 and 14 over Tanaka in view of Iso, Takano, Bucher and Dreschmann; claims 7 and 15 over Tanaka in view of Iso, Takano, Teramachi and Dreschmann; and claims 8 and 16 over Tanaka in view of Iso, Takano, Brucher, Teramachi and Dreschmann.

OPINION

We reverse the rejection of claims 17 and 18 and affirm the rejections of the other claims.

Claims 1-16

The Appellants provide a substantive argument only with respect to claim 1, which is the sole independent claim (Br. 10-13; Reply Br. 4-5). Although additional references are applied to claims 2-8 and 10-16, the Appellants do not argue the separate patentability of those claims (Br. 15-16). We therefore limit our discussion of claims 1-16 to claim 1. *See* 37 C.F.R. § 41.37(c)(1)(vii)(2004).

Tanaka discloses a pulley unit that has a clutch and can be installed on an auxiliary machine such as an air conditioner compressor, a water pump, an alternator or a cooling fan, driven from a crankshaft of an engine of an automobile or the like through a belt (col. 1, ll. 7-12). The pulley unit comprises a roller bearing (4) including balls (18) between an inner ring (16) and an outer ring (17), a lubricant retained in the roller bearing by an oil seal (20), a rotary outer ring (1) around which a belt (B) is wrapped, and an inner ring (2) attached to a shaft (not

numbered) (col. 3, ll. 21-34, 64-67; fig. 1). When the clutch is in a lock state the outer (1) and inner (2) rings rotate synchronously with each other (col. 4, ll. 7-10).

Iso discloses a roller bearing filled with a grease containing as base oils a perfluoropolyether oil having a straight-chain structure and a dynamic viscosity of 40-160 mm^2/s and a particulate fluororesin, and containing, as a thickening agent, a particulate polytetrafluoroethylene (abstract).

Takano discloses a roller bearing unit used, for example, for rotatably supporting a rotating shaft of a screw compressor (col. 1, ll. 6-8). Takano teaches (col. 2, ll. 24-36):

> [T]here have heretofore been various attempts to extend the life of the rolling bearing unit fitted for example to a screw compressor. A first arrangement has been carried out wherein a positive gap or actual gap (in contrast to a negative gap under preload conditions) is provided rather than a preload being applied to the pair of ball bearings of the rolling bearing unit. When a positive or actual gap is provided in this way, then the contact pressure on the rolling faces of the balls and on the inner and outer raceways of the respective ball bearings is smaller than that for the case of a preload applied, so that the fatigue life of the rolling faces, as well as that of the inner and outer ring raceways is improved.

Takano discloses, with respect to his invention, a ball bearing (5) having an assembly axial gap of 0.010 mm which provides a positive gap for the ball bearing (col. 7, ll. 40-41).

The Appellants argue that there would have been no motivation to combine Tanaka and Takano because unlike Tanaka, Takano is nonanalogous art (Br. 12-13). The test urged by Appellants of whether a reference is from an analogous art is first, whether it is within the field of the inventor's endeavor, and second, if it is not, whether it is reasonably pertinent to the particular problem with which the inventor was involved. *See In re Wood*, 599 F.2d 1032, 1036, 202 USPQ 171, 174

(CCPA 1979). A reference is reasonably pertinent if, even though it may be in a different field of endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering the inventor's problem. *See In re Clay*, 966 F.2d 656, 659, 23 USPQ2d 1058, 1061 (Fed. Cir. 1992). The Appellants argue, regarding the first prong of the test, that their field of endeavor is rotary elements that may be held together by clutches, whereas Takano's field of endeavor is screw extruders (actually, screw compressors) (Br. 12). The Appellants argue that, unlike their rotary elements, screw extruder roller bearings have inner and outer rings that do not rotate together such that there is no relative movement between them, and must support an axial load acting against the turns of the screw portion of the extruder (Br. 12; Reply Br. 4). The Appellants argue, with respect to the second prong of the test (Br. 13):

> Takano does not teach or suggest that there is solved the problem of wear in a rolling bearing used on the condition that the rolling bearing receives a rotation load, while a relative rotation between the inner ring and the outer ring is zero, as is the situation in a mechanism having a clutch; i.e., the problem solved by the present invention.

The Supreme Court's statement in *KSR Int'l. Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740, 82 USPQ2d 1385, 1396 (2007) that "[w]hen a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one" indicates that for prior art to be properly applied in a rejection it need not satisfy the first prong of the nonanalogous art test. The Supreme Court also stated in *KSR* that "the problem motivating the patentee may be only one of many addressed by the patent's subject matter. The question is not whether the combination was obvious to the patentee but whether the

combination was obvious to a person with ordinary skill in the art." *KSR*, 127 S.Ct. at 1742, 82 USPQ2d at 1397. Those statements indicate that for prior art to be properly applied in a rejection it need not satisfy the second prong of the nonanalogous art test as articulated in *Wood* and *Clay*. Hence, the Appellants' argument that Takano is nonanalogous art is not well taken. Regardless, because Takano pertains to using a gap to improve the fatigue life of roller bearings, it 1) logically would have commended itself to the Appellant's attention in considering their problem of roller bearing wear and, therefore, is in the Appellant's field of endeavor, and 2) is reasonably pertinent to the problem of roller bearing wear with which the Appellants were involved. Takano, therefore, is analogous art.

Moreover, Takano's disclosure that the positive gap was used "for example" in screw compressor roller bearings (col. 2, ll. 24-26) would have led one of ordinary skill in the art, through no more than ordinary creativity, to apply Takano's teaching regarding improving roller face fatigue life to other machines wherein roller bearing wear is a problem, such as that of Tanaka.[2] *See KSR*, 127 S.Ct. at 1741, 82 USPQ2d at 1396 (In making the obviousness determination one "can take account of the inferences and creative steps that a person of ordinary skill in the art would employ").

The Appellants argue that their figure 4 shows that Takano's 0.01 mm gap does not produce any shift in contact area but, instead, shows that the retainer and rolling elements remain stationary, thereby giving rise to wear problems (Reply Br. 5). That argument is not persuasive because the Appellants' claim 1 does not require a shift in contact area. Additionally, the recitations in claims 17 and 18 that

[2] The Appellants acknowledge that "Appellants and Tanaka are directed to the field of rotary elements that may be held together by clutches" (Br. 12) and that wear was a known problem in that type of device (Spec. 4:19-20).

the contact position of the rolling element is shifted indicates that claim 1, from which claims 17 and 18 depend, encompasses roller bearings that do not provide the contact position shift required by those dependent claims.

For the above reasons we are not convinced of reversible error in the Examiner's rejection of claims 1-16.

Claims 17 and 18

Claim 17 depends from claim 1 and requires that "the positive value of the radial clearance is set such that the contact position of the rolling element with respect to the raceway surface of the inner ring is gradually shifted when the relative rotation between inner and outer rings is zero." Claim 18 depends from claim 1 and requires that "the positive value of the radial clearance is set such that the contact position of the rolling element with respect to the raceway surface of the inner ring is shiftable in a circumferential direction when the relative rotation between inner and outer rings is zero."

The Examiner argues that "the contact area between the raceway surface and the inner ring of Tanaka as modified by Iso and further modified by Takano would inherently shift when the forces applied to the device change due to the bearing clearance" (final rejection mailed June 10, 2005, p. 3), and that "it is clear that the contact area is gradually shifted in the reference to Takano due to the presence of the clearance. See gap 9" (Ans. 5).

An inherent characteristic must be inevitable, and not merely a possibility or probability. *See In re Oelrich*, 666 F.2d 578, 581, 212 USPQ 323, 326 (CCPA 1981). The Appellants provide evidence in their figure 4 that a gap of 0.01 mm does not provide a contact position shift. The Examiner has not provided evidence or technical reasoning which shows that the Appellants' evidence is incorrect or that there is a difference between Takano's roller bearing and that in the

Appellants' figure 4 which causes Takano's 0.01 mm gap, unlike that in the Appellants' figure 4, to inevitably produce a contact position shift.

The Examiner, therefore, has not established a prima facie case of obviousness of the inventions claimed in the Appellants' claims 17 and 18.

DECISION

The rejection under 35 U.S.C. § 103 of claims 1, 9, 17 and 18 over Tanaka in view of Iso and Takano is affirmed as to claims 1 and 9 and reversed as to claims 17 and 18. The rejections under 35 U.S.C. § 103 of claims 2 and 10 over Tanaka in view of Iso, Takano and Brucher, claims 3 and 11 over Tanaka in view of Iso, Takano and Teramachi, claims 4 and 12 over Tanaka in view of Iso, Takano, Brucher and Teramachi, claims 5 and 13 over Tanaka in view of Iso, Takano and Dreschmann, claims 6 and 14 over Tanaka in view of Iso, Takano, Bucher and Dreschmann, claims 7 and 15 over Tanaka in view of Iso, Takano, Teramachi and Dreschmann, and claims 8 and 16 over Tanaka in view of Iso, Takano, Brucher, Teramachi and Dreschmann are affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED-IN-PART

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